

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A process for producing mechanical pulp from vegetative raw matter, said process comprising:

providing naturally-occurring vegetative raw matter;

placing said vegetative raw matter on a screen or grating with openings of a predetermined size;

using high pressure fluid jets, wherein the fluid is water and the pressure of the water is between 500 and 1500 atmospheres, to initially break apart said vegetative raw matter directly into small particles, wherein said particles comprise fibers of cellulose and said fibers of cellulose are of said predetermined size due to application of pressure by said jets on said vegetative raw matter while causing said vegetative raw matter to pass through said screen or grating or through a series of screens or gratings, each comprising successively smaller openings than those of the previous screen or grating in said series; and

separating single cellulose fibers directly from said vegetative raw matter, wherein said single cellulose fibers have increased surface area compared to the vegetative raw matter and wherein said single cellulose fibers are not damaged following the use of said high-pressure fluid jets;

initially sorting of fibers of cellulose by diameter;

final sorting and aligning the fibers of cellulose, said alignment being performed by passing said fibers of cellulose through a grating of a predetermined slit width, so as to allow fibers of cellulose with a diameter of said predetermined slit width to pass therethrough, thereby aligning said fibers of cellulose.

2. (Previously Presented) A process according to claim 1, further comprising the step of preliminary preparation of the vegetative matter prior to breaking apart said vegetative matter.

3. (Cancelled)

4. (Original) A process according to claim 1, wherein the vegetative matter is agricultural waste.
5. (Currently Amended) A process according to claim 4, wherein the agricultural waste comprises parts of agricultural plants from the group consisting of ~~comprising~~, but not limited to: cotton; corn; banana; sunflower; watermelon rinds; wheat; and other cereal crops or grasses.
6. (Original) A process according to claim 2, wherein the preliminary preparation of the vegetative matter includes removing the bark or outer layer/s of the stem.
7. (Original) A process according to claim 2, wherein the preliminary preparation of the vegetative matter includes soaking said matter in water.
- 8.-9. (Cancelled)
10. (Original) A process according to claim 1, wherein the openings in the screens are essentially square ranging between 1 and 20 mesh.
11. (Original) A process according to claim 1, wherein the gratings comprise parallel wires (bars) with a spacing of 1 to 20 bars per inch.
12. (Previously Presented) A process according to claim 1, wherein the series of screens comprises three screens having essentially square openings of 1 mesh, 5 mesh, and 15 mesh, respectively.
13. (Currently Amended) A process according to claim 1 [[3]], wherein initial sorting of fibers of cellulose by diameter is accomplished by causing them to pass through a series of screens or gratings, wherein each screen or grating in said series contains successively smaller openings.

14. (Currently Amended) A process according to claim 1 [[3]], wherein the final sorting and alignment-of the fibers of cellulose is carried out by causing said fibers of cellulose to pass through gratings.
15. (Currently Amended) A process according to claim 1 [[3]], wherein the sorted and aligned fibers of cellulose are pressed into bales using a pressure of 20 Atm to 400 Atm.
16. (Original) A process according to claim 15, wherein the bales are air dried at a temperature of 30 C to 70 C.
17. (Previously Presented) A process according to claim 1, comprising a further process of mechanical and/or chemical and/or biological delignification of the small particles of vegetative matter.
18. (Canceled)
19. (Currently Amended) A process according to claim 1 further comprising the following steps:
 - a. preliminary preparation of said vegetative matter; and
 - b. chemical delignification, bleaching, and cleaning;
 - ~~c. initial sorting of cellulose fibers by diameter;~~
 - ~~d. final sorting and alignment of fibers, said alignment being performed by passing said fibers through a grating of a predetermined slit width, so as to allow a fiber with a diameter of said predetermined slit width to pass therethrough, thereby aligning said fibers;~~
 - ~~e. pressing the sorted and aligned fibers into bales; and~~
 - ~~f. drying the bales.~~
20. (Previously Presented) A process according to claim 17, wherein the process of biological delignification occurs in water containing inoculum.

21. (Previously Presented) A process according to claim 17, wherein the process of biological delignification takes place in a reaction vessel.
22. (Original) A process according to claim 21, wherein the process of biological delignification is aided by heating the contents of the reaction vessel.
23. (Original) A process according to claim 22, wherein the heating is from room temperature up to a temperature of 65 C.
24. (Original) A process according to claim 21 wherein the process of biological delignification is aided by stirring the contents of the reaction vessel.
25. (Original) A process according to claim 24, wherein the stirring is carried out by means of a mechanical stirrer and/or streams of gas or water.
26. (Previously Presented) A process according to claim 21, wherein the biological delignification is carried out continuously by periodically removing essentially delignified fibers from the reaction vessel and replacing said removed portion with more vegetative matter, water, and inoculum.
27. (Original) A process according to claim 19, wherein stabilized hydrogen peroxide is used for chemical delignification and bleaching.
28. (Cancelled)
29. (Currently Amended) A process according to claim 13 ~~28~~, wherein the series of screens consists of four screens having essentially square openings of 25 mesh, 50 mesh, 75 mesh, and 100 mesh, respectively.

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30. (Currently Amended) A process according to claim 13 ~~28~~, wherein the series of gratings consists of four gratings comprising essentially parallel wires (bars) with a spacing of 25 to 100 bars per inch.

31. (Cancelled)

32. (Currently Amended) A process according to claim 14 ~~31~~, wherein the spacing between adjacent "bars" of the gratings (i.e. the slit width) is in the range of 20 μM to 300 μM .

33.-36. (Cancelled)

37. (New) A process according to claim 1, further comprising the steps of pressing the sorted and aligned fibers of cellulose into bales and drying the bales.